## XXVIII International Workshop on Deep-Inelastic Scattering and Related Subjects



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## Comparison of pp and $p\bar{p}$ differential elastic cross sections an d observation of the exchange of a colorless C-odd gluonic compound (D0 and TOTEM collaborations)

Thursday, 15 April 2021 11:30 (18 minutes)

We describe an analysis comparing the  $p\bar{p}$  elastic cross section as measured by the D0 Collaboration at a center-of-mass energy of 1.96-TeV to that in pp collisions as measured by the TOTEM Collaboration at 2.76, 7, 8, and 13 TeV using a model-independent approach. The TOTEM cross sections extrapolated to a center-of-mass energy of  $\sqrt{s} = 1.96$  TeV are compared with the D0 measurement in the region of the diffractive minimum and the second maximum of the pp cross section.

The two data sets disagree at the 3.4 $\sigma$  level and thus provide evidence for the *t*-channel exchange of a colorless, C-odd gluonic compound, also known as the odderon.

We combine these results

with a TOTEM analysis of the same C-odd exchange based on the total cross section and the ratio of the real to imaginary parts of the forward elastic scattering amplitude in pp scattering.

The combined significance is larger than 5 $\sigma$  and is interpreted as the first

observation of the exchange of a colorless, C-odd gluonic compound.

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